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NORTHERN ROCKY MOUNTAIN FOREST AND RANGE EXPERIMENT STATION

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SLASH BURNS WELL AT B.I. 10 to 20

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Fire danger measurements have been used for the past ten years in Region One as guides to judgment of the number of men needed in the fire control organization. Little if any use has been made of these same measurements, however, as indicators of good and bad slash burning conditions. There is an opportunity here which should be especially useful during the present period of excessive slash accumulations with inexperienced and insufficient manpower to do the burning. Results of some recent tests are also significant as they show the effects to be expected according to Burning Indices, or B.I.'s, given by the new Burning Index Meter.

On October 11 and 12, 1944, on the Priest River Experimental Forest several piles of white pine slash, two to four years old, were burned in three different fuel conditions, (1) on deep duff, (2) in scattered twigs, and (3) surrounded by cured grass, ferns, and other light vegetation. Piles were ignited throughout the day and early evening. Combustion was complete except for isolated branch stubs projecting outside the perimeter of the pile. Not a single case required any trenching or work to prevent spread of the fire to other piles or through other fuels. There was no spread, no spotting, and no hang-overs in either deep duff or rotten logs.

As these piles were all in or near a small stream bottom about 100 yards wide or on the lower portion of a south-facing aspect, the relation of fire behavior to Burning Index (at a standard, fully exposed danger station less than a mile away) is believed to be representative of what may be expected elsewhere on all but the most exposed and driest sites.

Fire danger data on these two days were as follows:

Date	Maximum temperature Degrees	Minimum humidity Percent	Afternoon wind m.p.h.	Fuel moisture Percent	B.I. Class
October 11	77	31	3	9.3	16
" 12	72	35	3	11.1	10

Experienced brush burners will recognize the fact that the above data do not tell the whole story. While they indicate light fuel or surface conditions, they do not necessarily show the condition of deep duff or of

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windfalls and other logs on the ground. These conditions are obviously important controls of whether slash fires will creep or hang over to flare up later.

At the Priest River branch station one index is obtainable from the "Large Log Moistures" measured every ten days. On October 6, less than a mile from the spot where the slash piles were burned, logs lying on the ground had the following moisture contents:

	Diameter of logs		
	6"	12"	18"
	Moisture content		
	Percent		
At an open, fully exposed site	30	25	24
Under a dense timber canopy	36	26	26

As yet we have no practicable method of measuring large log moistures at numerous field stations. It can be done electrically at selected spots in a log, but several years of testing have revealed too much error in this method. It is being done at Priest River by weighing logs 5 feet long, but this requires a difficult procedure in determining the oven-dry weight, special scales, and a wrestling match with the 200-pound, 18-inch logs every ten days without losing a splinter from a log in the process. Furthermore, at least three logs of each size are essential to get a dependable average. Consequently the large log moistures given above are merely evidence of information being acquired which will not become useful until we can devise a practicable field method.

In the meantime, the old rule of thumb of white pine slash burners, that brush burning should wait until fall rains amount to 2 inches, is the best available criterion of the condition of deep duff and large logs. The tests this year verify that criterion because the test fires did not creep or hang over, and the fall rains (September 1 to October 10) had amounted to 2.37 inches.

By combining the Burning Index with this rule of thumb, it is evident that fall burning of white pine slash can be planned with safety and efficiency at any time after approximately 2 inches of rain have fallen and when the B.I. rating is between 10 and 20. The latter is significant, of course, because with higher winds, lower humidity, or both, slash fires might give trouble. But in such cases the B.I. would rise and show this danger, provided that the measurements of factors used in computing the B.I. were made at a site comparable to the site of the slash burning. Where these two sites differ the factor measurements at the danger station can be readily converted to represent the slash burning site by use of charts 7, 9, and 13 in U.S.D.A. Circular No. 591, "Influence of Altitude and Aspect on Daily Variations in Factors of Forest Fire Danger."

A complete method of supervision and control is therefore available. The dangers and costs of slash disposal warrant its use.